ABSTRACT

A system and method are presented for the determination of Value-at-Risk (VAR) and other tail-risk measures for a portfolio of derivative securities. The present invention determines the tail of the probability distribution of portfolio returns based on first- and second order structural reliability (FORM/SORM) methods. As used herein, the present inventive method is referred to as "Reliability VAR." The inventive system and method of calculating VAR is not restricted to representation of positions in a portfolio as "delta-gamma" sensitivities to the underlying price returns. Additionally, the inventive system and method lends itself to the determination of VAR in the presence of underlying price returns with so-called "fat tails." In particular, a probability preserving transformation using a Hermite-model based correlation-mapping technique, previously used only in structural reliability analysis, has been applied to transform the VAR-related probability-estimation problem with non-Gaussian risk factors to an equivalent probability estimation problem in the standard Gaussian space.